ORIGINAL ARTICLE ÖZGÜN ARAŞTIRMA

# Pathological Internet use Levels and Psychiatric Diagnoses in Adolescents Admitted to a Child Psychiatry Outpatient Clinic after Face-to-face Education Restriction Due to the Pandemic

## Pandemi Nedeniyle Yüz Yüze Eğitim Kısıtlaması Sonrası Çocuk Psikiyatrisi Polikliniğine Başvuran Ergenlerde Patolojik İnternet Kullanım Düzeyleri ve Psikiyatrik Bozukluklar

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### Abstract

**Introduction:** During the period of social restrictions against the pandemic, the screen time of individuals increased significantly, and youths' mental health was adversely affected due to the restriction of peer interactions and physical activities. The aim of this study was to evaluate the levels of internet overuse and psychiatric disorders in adolescents who applied to the child psychiatry outpatient clinic after the distance education period.

**Materials and Methods:** A semi-structured tool, "Schedule for Affective Disorders and Schizophrenia for School-Age Children-Present and Lifetime Version" (K-SADS-PL) was used to assess psychiatric diagnoses and Young Internet Addiction Test (IAT) to determine excessive internet usage. A total of 141 adolescents aged 11-18 years were recruited for this study.

**Results:** The average score for IAT was statistically significantly higher in the youths with social anxiety disorder compared to those without (p=0.001) even after controlling for socioeconomic status (SES) (p=0.007). According to the hierarchical regression analyses, the girl gender (B=-6.899, p=0.029), younger age (B=-1.526, p=0.032) and co-morbidity of OCD (B=5.292, p=0.042) have statistically significantly predicted higher IAT scores in adolescents diagnosed with anxiety disorders.

**Conclusion:** Identifying the common psychiatric diagnoses related to pathological internet use in adolescents, who started face-to-face education after a long break would enable mental health professionals to plan appropriate interventions for problematic areas particularly in vulnerable population more quickly when similar outbreaks recur.

**Keywords**
Pathological internet use, psychiatric disorder, adolescent, pandemic

**Anahtar kelimeler**
Patolojik internet kullanımı, psikiyatrik bozukluk, ergen, pandemi

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### Öz

**Giriş:** Pandemiye yönelik sosyal kısıtlamaların olduğu dönemde ergenlerin ekran başında kalma süreleri çok artmış, akran etkileşimlerinin ve fiziksel aktivitelerin kısıtlanması nedeniyle ruh sağlıkları olumsuz etkilenmiştir. Bu çalışmanın amacı, uzaktan eğitim döneminden sonra çocuk psikiyatrisi polikliniğine başvuran ergenlerde internet aşırı kullanımı ve psikiyatrik bozukluk düzeylerinin değerlendirilmesidir.

**Gereç ve Yöntem:** Psikiyatrik tanıların değerlendirilmesi amacıyla yarı yapılandırılmış bir araç olan "Okul Çağı Çocukları için Duygulanım Bozuklukları

ve Şizofreni Görüşme Çizelgesi- Şimdi ve Yaşam Boyu" (ÇDŞG-ŞY) ve internet aşırı kullanımını belirlemek üzere Young İnternet Bağımlılığı Testi (IAT) kullanılmıştır. Bu çalışmaya 11-18 yaş arası toplam 141 ergen dahil edilmiştir.
**Bulgular:** Sosyal anksiyete bozukluğu (SAB) olan gençlerde, IAT ortalama puanı SAB bulunmayanlara oranla istatistiksel olarak anlamlı derecede yüksekti (p=0,001). Sosyoekonomik durum (SED) kontrol edildikten sonra da (p=0,007) istatistiksel anlamlılık devam etmekteydi. Hiyerarşik regresyon analizlerinnin sonuçlarına göre kız cinsiyet (B=-6,899, p=0,029), küçük yaş (B=-1,526, p=0,032) ve OKB eş tanısı (B=5,292, p=0,042) anksiyete bozuklukları tanısı bulunan ergenlerde daha yüksek IAT puanlarını istatistiksel olarak anlamlı şekilde öngörmüştür.
**Sonuç:** Uzun bir aradan sonra yüz yüze eğitime başlayan ergenlerde patolojik internet kullanımı ile ilişkili yaygın gözlenen psikiyatrik tanıların belirlenmesi, benzer salgınlar tekrarlandığında ruh sağlığı profesyonellerinin özellikle risk altındaki bireylerde sorunlu alanlara uygun müdahaleleri daha hızlı planlamasına katkıda bulunacaktır.

## Introduction

In the literature, "Pathological internet use" tends to be used to refer to use the internet excessively. As the internet/technology itself is not an object of addiction but can be a way to reach the addicted substances and situations, "internet addiction" isn't sufficient to define using internet in pathological levels. Throughout this paper we use the term "Pathological internet use" which has been suggested by Gönül (1). "Pathological internet use" has been included in the psychiatric diagnostic classifications with the mention of Online Gaming Disorder in the "conditions for further study" appendix in Diagnostic Statistical Manual-5 (DSM-5) (2). But it has not yet been established whether pathological internet usage is a separate psychiatric diagnosis since internet/technology abuse/dependence is co-occurred with a high rate of axis 1 psychiatric disorders (3). During the pandemic period, due to the restrictions, the length of time that adolescents are required to be online, including education, and therefore the risk of internet addiction has increased. Besides, decreased peer interaction and indirectly reduced stress regulation opportunities due to social isolation caused mental health of adolescents to be adversely affected. Worsening of interaction with parents whose mental health was deteriorated due to economic problems or anxiety related to the disease have contributed to this situation, and it has been known that adolescents with low socioeconomic status or who already have psychiatric problems have been more affected (4). At the same time, the appeal of adolescents with a psychiatric diagnosis and ongoing treatment to a doctor has been delayed due to the social restrictions regarding pandemic (5). Despite this interest, no one to the best of our knowledge has determined the psychiatric disorder diagnoses by structured interviews in adolescents brought to outpatient clinics after a long period of distance education. Additionally, what has been known about internet addiction and psychopathology is largely based on studies have tended to focus on adults and using self-report scales (6-9). In the present study, it was primarily aimed to determine internet excessive use levels and psychiatric diagnoses of the adolescents who were brought to a Child and adolescent psychiatry outpatient clinic after a long school restriction period, and secondly to evaluate the relationship between pathological internet use levels and current psychiatric diagnoses of the youths.

## Materials and Methods

Adolescents aged 11-18 years who applied to the child and adolescent psychiatry outpatient clinic in October 2021-February 2022 when the schools reopened after a 1.5-year break in face-to-face education due to the pandemic were included in the study. Patients, with autism spectrum disorder (n=2), psychotic disorder (n=1) and clinical impression/history of mental retardation (n=5), were not included in the study. The data of 5 participants who were detected to have diagnosis of special learning disorder (SLD) and a youth with hearing loss during the psychiatric examination were excluded from the analysis. A small number of patients with neurodevelopmental disorders, such as ASD and SLD were not included in the statistical analysis to investigate the predictors of the pathological internet use in a more homogeneous sample.

Necessary permissions for the study were obtained from Uludağ University, Faculty of Medicine Clinical Research Ethics Committee (date 06.10.2021 and number 2021-14/17).

"Schedule for Affective Disorders and Schizophrenia for School-Age Children-Present

and Lifetime Version" (K-SADS-PL) was applied to the adolescents by a child psychiatrist in an attempt to determine the psychiatric diagnoses. A detailed information form prepared by the researcher in which the age, gender, parent's education and employment status, monthly family income, whether they had received psychiatric treatment before, and their internet usage areas was filled by the researcher herself out by asking the participants. The adolescents were also asked to fill out "Young Internet Addiction Test-short form" (IAT).

*Schedule for Affective Disorders and Schizophrenia for School-age Children-present and Lifetime Version*

K-SADS-PL was developed by Kaufman et al. (10) for the pschiatric diagnostic assessment and revised based on DSM-5 criteria in 2016. Turkish validity and reliability study was carried out by Unal et al. (11). Authors have stated that, the validity and reliability of this adaptation has been demonstrated for wide range of disorders. The scale, which enables to assess psychiatric disorders other than specific learning disorder and mental retardation, is made up of 3 parts. In our study, during the first phase, the information about child's demographic findings, complaints, and previous treatments were obtained from parents. When any positivity was found in the second part of the scale, in which about 200 specific psychiatric symptoms were checked, the diagnoses were clarified with additional symptom lists. As soon as these steps have been carried out, in the third part, the current functional level of the child was determined. Since it is a semi-structured interview tool, psychiatric diagnoses causing functional impairment were detected by the child and adolescent psychiatrist after interviews were carried out with the adolescent and his/her family. Rates of the participants with subthreshold symptoms of psychiatric disorders were also noted.

*Young Internet Addiction Test (IAT)-short Form*

The IAT-short form was developed by Pawlikowski et al. (12) in accordance with the scale which was created by Young (13) through adapting the diagnostic criteria of pathological gambling to internet addiction. Answers ranging from 1 to 5 are given to the questions of the IAT-short form, which consists of 12 items. Although the scale does not have a cut-off value, the high total score indicates the severity of excessive internet use. The IAT-short form was used in a study conducted with university students in our country (14). It was stated that Young IAT-short form Cronbach's alpha coefficient was found as 0.91 in university students and 0.86 in adolescents. Correlation coefficient for test-retest reliability was found as 0.93 in university students and 0.86 in adolescents. Authors have suggested the scale was a valid and reliable tool for Turkish population as well.

*Statistical Analysis*

The data were evaluated by using the Statistical Package for the Social Sciences (version 20) program. Descriptive statistics were shown as mean-standard deviation or percentages (%). A 95% confidence interval was used to assess the data. Although the educational level and working status of the parents were ordinal variables, they were accepted as dummy variables and calculated as continuous variables in our study. The sum of the scores was expressed as socioeconomic status (SES). The correlation between the SES and the IAT total score variables were tested by Spearman correlation analysis. The IAT scores were compared according to the presence of co-morbid psychiatric diagnoses of the youths by adjusting the SES variable using 1-way analysis of covariance. Finally, in order to obtain a more homogeneous sample, children and adolescents with anxiety disorder were grouped and regression analysis was performed. The independent variables that might influence IAT scores were age and gender in the first step and comorbidity with obsessive-compulsive disorder (OCD) in the second step. For all analyses statistical significance was set at $p<0.05$.

**Results**

The mean age was (M=14.68, SD=1.8) of the 141 participants recruited for this study. A hundred and three (73.0%) of the youths were girls; 38 (27.0%) of them were boys. On average we found values for the IAT of (M=30.82, SD=10.3). There was no statistically significant difference in the average IAT scores in terms of gender (139) (p=0.055). Seventy-three (67%) of the participants have applied to the psychiatry outpatient clinic for the first time, while 36 (33%) had been diagnosed before. There was no significant difference in the mean IAT total score between those diagnosed for the first time and those already followed (t=0.707, p=0.481). No statistically significant correlation was

observed between IAT total score and age (p=0.070) or SES levels (p=0.209). When the youths were divided into 3 groups according to the scores, they got from the IAT, it was revealed that 15 (11%) of them were in the highest range (45-60), 56 (41.2%) of moderate range (30-44) and 65 (47.8%) of them mild (12-29).

When the internet usage areas of youths were evaluated; it was determined that the mean IAT total score of the adolescents who stated that they used social media frequently (71) was statistically significantly higher than those who did not (20) (t=-3.125, p=0.002, 95% CI=-13.39-2.98). Nevertheless, it was found that the mean scores of the adolescents who stated that they frequently used the internet for research/study (71) were statistically significantly lower than those who did not (21) (t=2.914, p=.005, 95% CI=2.38-12.62). No significant difference was identified in terms of IAT score between those who said that they used internet frequently for gaming and those who did not (p=0.311).

Statistical analyses showed that 134 (95%) of the 141 participants had at least one psychiatric disorder while 87 (65.9%) of the participants had two or more psychiatric disorders. (Table 1 shows the distribution of present psychiatric diagnoses). Participants with multiple psychiatric diagnoses (two or more) (85, M=33.12, SD=10.05) had significantly higher IAT scores than those with a single psychiatric diagnosis (45, M=27.04, SD=10.08) (t=-3.286, p=0.001, 95% CI=-9.74-2.42). It's fundamental to note that there was a statistically significant increase in the IAT scores in the youths with social anxiety disorder (38) compared to those without (90) (t=-3.527, p=0.001, 95% CI=-10.8-3.04). No such difference was found for other psychiatric disorders. Even after controlling for SES, the higher IAT scores in the group with social anxiety disorder remained statistically significant (after adjusted for SES, p=0.007, F=5.317).

When the cases with at least one anxiety disorder diagnosis were considered as the study group and analyzed based on whether M. Depressive disorder/ dysthymia, OCD and ADHD diagnoses were accompanied or not; patients with OCD diagnosis in addition to the anxiety disorder diagnosis (25), had a significantly higher IAT score than those without (49) (t=-2.130, p=0.037). Further analyses were carried out to examine the factors predicting the mean IAT total scores in anxiety disorders group (74). The age and gender variables were entered as the first block and the results indicated that the model was significant, and 14.3% of the variance was explained by the model (F=5.358, p=0.007) in the hierarchical linear regression analysis. After entry of the co-morbidity of OCD variable at the second block, the model was still significant (F=5.191, p=0.003) and total variance explained by the model as a whole was 19.8% (R squared change=0.055). In the model 2; the co-morbidity of OCD significantly predicted higher IAT total scores in adolescents with anxiety disorders (B=5.292, p=0.042). The gender (B=-6.899, p=0.029) and age (B=-1.526, p=0.032) variables were still statistically significant (Table 2).

Table 1. Distribution of psychiatric diagnoses

| | n | % |
|---|---|---|
| M. depression | 68 | 50.7 |
| Generalized anxiety disorder | 44 | 32.8 |
| Social anxiety disorder | 39 | 29.1 |
| Attention deficit hyperactivity disorder | 33 | 24.6 |
| Obsessive-compulsive disorder | 29 | 21.6 |
| Dysthymia | 17 | 12.2 |
| Specific phobia | 14 | 10.4 |
| Panic disorder | 11 | 8.2 |
| Separation anxiety disorder | 7 | 5.2 |
| Tic disorders | 7 | 5 |
| Enuresis | 7 | 5 |
| Trichotillomania | 5 | 3.7 |
| Eating disorder (including subthreshold) | 4 | 2.9 |
| Skin picking disorder | 3 | 2.2 |
| Bipolar disorder, unspecified (BD) | 3 | 2.2 |
| Kleptomania | 2 | 1.5 |
| Conduct disorder | 2 | 1.5 |
| Gender dysphoria | 2 | 1.5 |
| Oppositional defiant disorder | 1 | 0.7 |
| Post-traumatic stress disorder | 1 | 0.7 |
| Conversion disorder | 1 | 0.7 |

## Discussion

In the present study, internet addiction and psychopathology were examined in a clinical sample of adolescents when the schools reopened after a 1.5-year break in face-to-face education due to the pandemic.

| Table 2. Hierarchical linear regression analysis findings for variables predicting IAT total value in anxiety disorders group | | | | |
|---|---|---|---|---|
| | Unstandardized coefficients | | Standardized coefficients beta | Sig. |
| | B | Std. Error | | |
| Model 1 | | | | |
| Age | -1.648 | 0.711 | -0.269 | 0.024 |
| Gender | -6.733 | 3.156 | -0.247 | 0.037 |
| Model 2 | | | | |
| Age | -1.526 | 0.696 | -0.249 | 0.032 |
| Gender | -6.899 | 3.079 | -0.254 | 0.029 |
| Co-morbidity of OCD | 5.292 | 2.551 | 0.235 | 0.042 |
| OCD: Obsessive-compulsive disorder, IAT: Internet Addiction Test | | | | |

The majority of the subjects were girls (69.0%) in our study. The inclusion criteria of the study may be responsible for this. Firstly, adolescents in the 11-to-18 age group have been included in the study, and it has been known that diagnoses such as mood disorders and anxiety disorders, which are common in this age group, are more frequent in girls than boys. Secondly, youth with diagnoses of such as autism spectrum disorder or specific learning disorder, which are seen higher in boys than girls, have been excluded from the study, since K-SADS is not suitable for detecting these developmental disorders.

In a study conducted with middle and high school students in Canada, spending more than 2 hours a day on social media has been associated with higher levels of psychological distress, suicidal ideation, and self-rated mental health symptoms (15). In a study from Netherlands, it has been shown that the risk of internet addiction was increased in those who use social networking sites (16). According to our results, it was determined that the mean IAT total score of the adolescents who stated that they used social media frequently was statistically significantly higher than those who did not. However, co-existing psychiatric diagnoses didn't differ related to social media usage in the present study.

Our study revealed that the most common psychopathologies were m. depressive disorders, anxiety disorders, ADHD and OCD and participants with multiple psychiatric diagnoses had significantly higher IAT scores than those with a single diagnosis. It is crucial to note that over half of the youths had m. depressive disorder including sub threshold cases. When the association between higher IAT scores and each psychiatric diagnoses was investigated, statistically significant result was present only for social anxiety disorder. Milani et al. (17) have suggested that pathological internet use was associated with poor interpersonal relationships and avoidant coping behavior. As a result of a follow-up study conducted with 2293 high school students in Taiwan, it was determined that depression, attention deficit-hyperactivity disorder and social phobia predicted the occurrence of internet addiction in the follow-up (18). Kaur (19) indicated that adolescents' pathological internet use levels and perceived social self-efficacy were negatively correlated. It might have been possible that the avoidance behavior of youths with social anxiety was reinforced during the pandemic period, as well as the loss of the opportunity to develop their social skills, and the reinforcement of their negative beliefs about themselves.

In the literature on investigating the relationship between internet addiction and psychopathology, there are studies examining the psychopathology of individuals who have received a certain score from the self-report scales in terms of pathological internet use. In a review evaluating the relationship between pathological internet use and psychopathology, it was stated that there was a 75% association with depression, 57% with anxiety disorders, 100% with ADHD, and 60% with OCD. In the same paper, the fact that no study reported associations with social phobia and the heterogeneity of studies on the definition and diagnosis of pathological internet use were emphasized (20). Before the COVID pandemic, in two similar studies from Turkey (21,22), adolescents who were referred to child psychiatry outpatient clinics due to pathological internet use complaints and co-existing emotional-behavioral problems were examined.

Adolescents, with a Young Internet Addiction scale score above a certain value were screened with a semi-structured interview tool (K-SADS) in these studies. The most common psychiatric diagnoses detected in internet addicts according to both studies were m. depressive disorder, anxiety disorders, and ADHD in line with the previous results (23). Comparing our results with these studies, it should be taken into account that adolescents with varied levels of internet use were evaluated in our study. Additionally, the fact that our sample is predominantly female, and that neurodevelopmental disorders such as SLD and autism spectrum disorders excluded from the study might have caused not to find a relationship between pathological internet use and ADHD. Because, it has been known that ADHD is more common in males and is often seen together with other neurodevelopmental disorders. There's also a study that evaluated internet addiction with IAT in adolescents with a psychiatric diagnosis, who were followed up in an outpatient clinic of a children's hospital, similar to our study, but conducted before the pandemic. In that study, a significant positive relationship was found between IAT scores and mood disorders (24). Further, in a study conducted with medical students before the pandemic, those who scored 50 out of 100 in Young's internet addiction test were considered as internet addicts and psychopathology was investigated. Self-esteem, social anxiety, and depression were evaluated with self-report scales in that study. It has been shown that only 10.5% of the students got high scores indicating addiction and that depression and social anxiety were highly correlated with the IAT scores (25). This value correlates fairly well with our study finding which revealed that 10.9% of the adolescents' mean IAT scores were in the highest range.

Explanatory analyses have led us to conclude that although internet addiction scores in the initial sample did not differ in terms of age and gender, younger age and female gender predicted higher IAT scores in the anxiety disorders group. According to the results of a 2016 study that evaluated the relationship between internet addiction and depression in terms of gender, it was pointed out that depression leads to excessive use of the internet in boys, while internet overuse leads to depression in girls (26). Investigation of gender-specific co-morbid psychiatric conditions in cases with pathological internet use is important in terms of determining individual-specific interventions. Our results would also seem to suggest that co-morbidity with OCD were associated with higher IAT scores in adolescents with anxiety disorders. In a study conducted with students aged 16-18 in Greece, internet addiction scores were found to be associated with obsessive compulsive symptom levels (27). In an adult study conducted with female patients with eating disorders, a relationship was found between compulsive buying and internet excessive use levels (28). In another study, conducted in adult individuals with OCD, internet addiction scores were found to be higher compared to controls, and positively correlated with impulsivity (29). Our results are in line with previous studies, conducted to elucidate the nature of Internet addiction and reported that internet addiction was closely related to compulsion.

Finally, several weaknesses need to be considered. To begin with, the small sample size could have influenced the study results. The child psychiatry outpatient clinic of the state hospital where our study was conducted is a center with frequent referrals. Although the number of cases admitted within a 5-month period was quite high, the sample could have been increased by cooperating with different centers. In this way, participants from varied socio-cultural environments could also have been included in the study. Another limitation is that cases who applied to the polyclinic for the first time and were diagnosed before were evaluated together. However, it was observed that the majority of the youths who were diagnosed before did not receive treatment in the current situation. Further, the fact that the IAT-short form was used in order to identify pathological internet use could have affected the comparisons with similar studies in this area. Despite this, less time-consuming instrument represents a useful alternative to scales' long version especially when studying with adolescents.

## Conclusion

The principal advantage of our study is that the psychiatric diagnoses have been determined using a semi-structured clinical interview by a child and adolescent psychiatrist. We hope that the current study adds to our understanding the association with pathological internet use and psychopathologies of adolescents based on data from clinical samples

during the pandemic period. Increasing findings on relationship between pathological internet use and psychiatric disorders has been important for a better understanding of the mechanism of internet addiction and the organization of appropriate/early interventions.

*Ethics*

*Ethics Committee Approval:* Necessary permissions for the study were obtained from Uludağ University, Faculty of Medicine Clinical Research Ethics Committee (date: 06.10.2021, decision no: 2021-14/17).

*Conflict of Interest:* No conflict of interest was declared by the authors.

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